REMARK

This is in response to the office action dated September 25, 2007, in which the claims were rejected based on Fullerton (US 5,677,927) in view of Omura (US 5,157,686) and Devon (US 5,692,127). Claims 19-25 remain in the application.

Fullerton discloses subcarriers modulated in several ways, including frequency modulation and amplitude modulation. The modulated subcarrier is used to time shift pulses resulting in a pulse position modulated (PPM) signal. Fullerton also describes direct digital modulation using Manchester encoding or combining the use of the PPM and the Manchester encoding. An example of an encoded pulse train is shown in Figure 5B as train 504.

Omura describes Manchester encoding and the use of PPM to represent Manchester encoded data bits (see column 9, beginning line 35). Manchester encoding, applicant concedes, is well known and uses one biphasic pulse to represent one binary state, and a second biphasic pulses to represent the other binary state. The difference between the biphasic pulses is whether its first portion is positive-going or negative-going.

Devon describes PPM where multiple bits are represented by the position of a pulse in a frame.

First it should be pointed out that PPM is different from the encoding occurring in the present invention. In PPM, it is the pulses position in a frame which determines its value. In the present invention, it is the time between the pulses that determines its value. The difference can be seen by referring to Figure 4 of Devon. A pulse may occur in one of four parts of a frame. Assume that the pulse 410 occurs in the very first part of a frame indicating the bits 00. After the pulse 410 occurs, assume the next data to be transmitted are the bits 11. With PPM, the frame 400 must be first completed and then in the next frame a pulse occurs in the fourth position of that frame to indicate the transmission of 11. In effect, time is measured from the beginning of each frame. The time may be

measured between two consecutive pulses. However, when this is done, the position of the first pulse in its frame must be known in order to determine the value of the second pulse. Consequently, a given time between pulses will not always represent the same binary bits.

It is important in PPM that two pulses not occur during the same frame. For instance, as taught in Devon, when this occurs, it is assumed there is an error (a collision) as shown by waveforms 418 and 420 in Figure 4. Similarly, as described in Fullerton, the frames are cross correlated to determine the frame's contents. This is a frame-by-frame analysis and is not the same as measuring the time between pulses. In contrast, in the present application a first time represents a first plurality of bits, and a second time represents a second plurality of bits. There is no dead time as there is in PPM when a pulse is positioned in the beginning of a frame.

The Examiner relies on the Manchester encoded bits and, for example, in Figure 2 of Omura, the encoding of the data sequence 0110101. No matter how you consider this or no matter where you place it, it is not the repeated alternating of the biphasic pulses of the present invention. The Manchester encoding of this sequence adds nothing to the combination of Fullerton and Omura since the resulting biphasic pulses do not alternate. Their polarity is dictated by the data being transmitted. There is nothing to suggest, teach or motivate the use of the alternating biphasic pulses and the use of the time between them to encode data. The best you can say for the prior art is that it does have 1s and 0s, there are biphasic pulses, and the time between pulses is used to determine data. While it may be easy to implement the present invention, since the biphasic pulses are known, and time modulation, in one form or another, is known, what is missing is the alternating of the biphasic pulses. Alternating marks is also a known technique, but again this is not alternating biphasic pulses. See "A bipolar repeater for pulse code signals" by JS Mayo, The Bell System Technical Journal, January 1962.

Analogies to make a point of non-obviousness often fall short, but perhaps one is in order here. It is well-known to paint emergency vehicles in red or in yellow. And, one may see a red vehicle followed by two yellow vehicles followed by a red vehicle on their way to an emergency. Any sequence of red and yellow colors on these vehicles as they pass is possible. But assume one discovers that a vehicle striped in red and yellow provides unexpected recognition of the vehicle, as an emergency vehicle, beyond anyone's expectations. In the prior art, the cans of red and yellow paint are opened at the same time at a paint shop, one vehicle is being painted red, another yellow as they move along a manufacturing line. It is a simple task to stripe a vehicle with red and yellow. Yet, the simplicity in carrying out the striping, or the fact that red and yellow vehicles follow each other, does not make the striping of a single vehicle obvious. Similarly, the 1s and 0s, the positive-going and negative-going biphasic pulses, and time modulation are all present in the prior art. What is lacking is alternating of the biphasic pulses. There is nothing obvious about providing this alternation in time modulation.

Applicant submits that the claims in the present application are allowable, and an early allowance would be appreciated.

If there are any additional charges, please charge them to our Deposit Account Number 02-2666. If a telephone conference would facilitate the prosecution of this application, the Examiner is invited to contact Edwin H. Taylor at (408) 720-8300.

Respectfully submitted,
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